REMARKS

Applicants amend claims 1 and 7 and cancel claim 4 and 19 without prejudice or disclaimer. Claims 1, 3, 5-9, 11, 13 and 15-18 and 20 are all the claims pending in the application.

Claim objection

Claims 1, 3, 5-9, 11, 13 and 15-18 and 20 are objected to because of several informalities.

In view of the claims amendments to claims 1 and 7, Applicants respectfully requests the Examiner to withdraw the objection to claims 1, 3-9, 11, 13 and 15-18 and 20.

Claim rejections under 35 U.S.C. § 112, first paragraph

Claim 5 is rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement.

MPEP § 2163 states that:

> There is a strong presumption that an adequate written description of the claimed invention is present when the application is filed. *In re Wertheim*, 541 F.2d 257, 263, 191 USPQ 90, 97 (CCPA 1976) ("we are of the opinion that the PTO has the initial burden of presenting evidence or reasons why persons skilled in the art would not recognize in the disclosure a description of the invention defined by the claims"). The issue of a lack of adequate written description may arise when an aspect of the claimed invention has not been described with sufficient particularity such that one skilled in the art would recognize that the applicant had possession of the claimed invention. That is, the claimed invention as a whole may not be adequately described if the claims require an essential or critical feature which is not adequately described in the specification and which is not conventional in the art or known to one of ordinary skill in the art.

Applicants respectfully submit that claim 5 is an original claim submitted when the application was filed. Therefore, as clearly stated in the MPEP, there is a strong presumption that an adequate written description of the claimed invention as recited in claim 5 is present when the application is filed.

Moreover, the initial burden is on the Examiner (or PTO) to present evidence or reasons why person skilled in the art would not recognize in the disclosure description of the invention defined by claim 5. The Examiner has not met this burden at least because the features of the original claim provide adequate support.

In addition, Applicants respectfully submit that the specification does describe the invention in such terms that one skilled in the art can make and use the claimed invention is to ensure that the invention is communicated to the interested public in a meaningful way.

For instance, page 5, lines 3-11 of the specification describes that:

> According to another very advantageous embodiment of the present invention, wherein said method of coding is based on a code excited linear prediction (CELP-) algorithm comprising **a synthesis section, elements of a matrix representing a transfer function of at least one filter of said synthesis section, and/or elements of auto-correlation matrices used within said CELP-algorithm and/or further precalculation and postcalculation steps for a/said comparison of code vectors are generated/evaluated in parallel.** This leads to an acceleration of the calculations performed within the CELP-algorithm which is proportional to the degree of parallelism achieved.

Further, page 10, lines 17-23 describes that:

> An additional reduction of execution time is achieved by generating/evaluating elements of matrices representing a transfer function of at least one filter of said synthesis section SYN, and/or

> elements of auto-correlation matrices used within said CELP-algorithm, in parallel. A significant decrease of execution time can especially be achieved by parallel processing of the elements of said auto-correlation matrices because these matrices must be cyclically re-calculated.

In at least the above cited portions of the specification, the Applicants disclosure clearly describes processing the CELP-algorithm in such terms that one skilled in the art can make and use the claimed invention is to ensure that the invention is communicated to the interested public in a meaningful way. In particular, the specification describes CELP algorithm comprising a synthesis section, elements of a matrix representing a transfer function of at least one filter of said synthesis section, and/or elements of auto-correlation matrices used within said CELP-algorithm. As such, the specification does explain how the CELP algorithm is processed in parallel.

Accordingly, Applicants respectfully request the Examiner to withdraw this rejection of claim 5.

Claim 19 is rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

In view of the cancellation of claim 19, the rejection with regard to claim 19 is moot.

Claim rejections under 35 U.S.C. § 112, second paragraph

Claims 1, 3, 5-9, 11, 13 and 15-20 are rejected under 35 U.S.C. § 112, second paragraph, as being allegedly indefinite and failing to particularly point out and distinctly claim the subject matter which the Applicant's regards as the invention.

Further, the Examiner asserts that the metes and bounds of claim 19 are indefinite.

In view of the claim amendments to claims 1 and 7 submitted herewithin this Amendment, Applicants respectfully request the Examiner to withdraw the rejection of these claims. Further, in view of the cancellation of claim 19, the rejection with regard to claim 19 is moot.

Claims rejection under 35 U.S.C. § 103

Claims 1, 3, 5-9, 11, 13 and 15-18 and 20 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kwan et al. ("Implementation of DSP-RAM: An architecture for parallel Digital Signal Processing in Memory," 2001) in view of Davidson et al. (U.S. Patent: 4,868,867; hereinafter "Davidson"). Applicants traverse the rejection for at least the following reasons.

Claim 1 recites *inter alia*, "performing a comparison of the plurality of code vectors within said codebook search to determine the optimal code vector, wherein said comparison is based on a cross multiplication expression

$$C_t * E_{best} >< E_t * C_{best},$$

calculated in parallel for every vector, which is based on fixed point operations performed." The Examiner concedes that Kwan does not disclose these features of claim 1. However, the Examiner asserts the Davidson discloses the features that are missing in Kwan. Applicants respectfully disagree for at least the following reasons.

Davidson is directed to a vector excitation coder compresses vectors by using an optimum codebook design offline, using an initial arbitrary codebook and a set of speech training vectors exploiting code vector sparsity (Abstract). Davidson discloses performing a codebook search for each vector within one frame by taking all N PE code vectors in the codebook, and using them as pulse excitation vectors cj, pass them one at a time through the scalar 30, long-

term synthesizer 26 and short term weighted synthesizer 25 in cascade and calculate the vector zj that results fro each of the PE code vectors. This is done N times for each new input vector zn. Next, the weighted vector zn is subtracted from the zj to produce error ej. This is done to each of the N PE code vectors and codebook 20 and the set of errors {ej} is stored in block 34 which computes the Euclidean norm (column 10, lines 41-53). Further, Davidson discloses that a codebook search is performed by finding the cj which maximize the ratio in Equation (6, see column 11) using a cross-multiplication scheme.

However, Davidson fails to disclose wherein said comparison is based on cross multiplication expression

$$C_t * E_{best} >< E_t * C_{best,}$$

calculated in parallel for every vector, which is based on fixed point operations performed.

Specifically, Davidson discloses cross-multiplying the numerators N1 and N2 with denominators D1 and D2 and comparing the resulting products to determine if N1D2>N2D1. Further, each time the control updates the registers based on the comparison, it updates a register with the index of the current excitation code vector. When all excitation vectors cj have been tested, the index to be transmitted is present in the register. That register is cleared at the start of the search for the next vector. Thus, Davidson only discloses performing the above described process one after another for every vector and not in parallel as recited in the claim.

Also, since Kwan does not even disclose cross-multiplication scheme, it would be illogical for Kwan to disclose wherein said comparison is based on a cross multiplication expression

$$C_t * E_{best} >< E_t * C_{best},$$

calculated in parallel for every vector, which is based on fixed point operations performed.

In addition, Applicants respectfully submit that it would not have been obvious to one of ordinary skill in the art to combine the teachings of Kwan and Davidson as asserted by the Examiner. In particular, Applicants submit that since Kwan is directed codebook search using **L2 norm** and Davidson discloses passing each vector in a codebook through scalar, long-term synthesizer and short term weighted synthesizer in cascade, the cited references are directed to entirely different methods of searching codebooks. Thus, there is no reason why one of ordinary skill in the art would combine two different methods as asserted by the Examiner.

Moreover, Kwan does not disclose or remotely suggest using cross multiplication expressions in computing the L2 norm. In fact, Kwan discloses that the L2 norm is defined to be the sum of the squares of the difference between corresponding components of the data vector and a codeword (page 0344 last paragraph). As such, there is no reason why one of ordinary skill in the art would have been motivated to incorporate a feature (cross multiplication expression) that is not even mentioned in Kwan and would not be compatible with method of calculating L2 norm.

Further, the Examiner asserts that it would have been obvious to combine the teaches of Kwan with cross multiplication scheme in order to provide a comparison scheme that is suitable for a DSP that has low memory requirements. On the contrary, the method disclosed in Kwan (L2 norm) does not disclose or require a comparison scheme or cross multiplication scheme. Therefore, it would not have been obvious to one of ordinary skill in the art to incorporate a cross multiplication scheme with the teachings of Kwan. In fact, such modification would

certainly cause the teachings of Kwan to deviate from the primary purpose (method for searching codebooks using L2 norm). In other words, the proposed combination defeats the primary purpose of Kwan.

In view of the above, Applicants submit that claim 1 is allowable over the cited references.

Claim 7

Applicant respectfully submits that claim 7 recites subject matter analogous to claim 1, and therefore is allowable for at least the analogous reasons claim 1 is allowable.

Claims 2, 3, 5-6, 8, 9, 11-18 and 20

Applicant submits that claims 2, 6, 8, 9, 11-18 and 20 depend from either claim 1 or 7, and therefore are allowable at least by virtue of their dependency.

With regard to claim 20, the Examiner alleges that page 344 discloses "evaluating an index of each optimal group code vector ensures conformity with a linear search method." Applicants respectfully disagree with the Examiner for at least the following reasons.

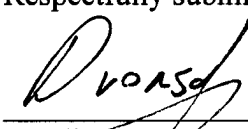
In page 344, section 3.3, Kwan discloses that instead of sending a data vector, a much smaller index of the matching codeword is sent. At the receiver, the index is used to retrieve on codeword from a copy of the same codebook. Applicants respectfully submit that Kwan discloses an index that is merely used to select a code word and does not disclose anything about evaluating the index. Furthermore, the cited portions of Kwan completely fail to disclose anything about the evaluating indexes for **ensuring conformity with a linear search method.**

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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